RECIPROCITY

F. H. Meyer, Editor
102 Ross Hall
University of Wisconsin
Superior, WI 54880

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Treasurer: Rainer Huck
1195 South Windsor St.
Salt Lake City, UT 84105

Secretary: Ronald W. Satz
Transpower Corporation
P. O. Box 473
Fort Washington, PA 19034

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ADVANCES OF THE RECIPROCAL SYSTEM

The Fifth Annual NEW SCIENCE ADVOCATES Conference is scheduled to take place in the city of the Marshall Space Flight Center, Huntsville, Alabama, during the week-end of August 22-23, 1980. For more details contact NSA member, Hans Wuenscher, 2004 Dogwood Lane, Huntsville, Alabama 35810, (205) 536-7975. More information also in next issue of RECIPROCITY.

N.B. A letter of the deceased Editor, John W. Campbell of ANALOG, written a decade ago to the living Dr. Frank V. Meyer, reprinted herein, should be studied carefully by every NSA member. It brilliantly discloses that humankind can give up an inadequate theory that works--the nuclear atom--when a better theory presents itself, but even then only via struggle to marshall evidence demonstrating that the new theory actually is truer.

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analog
science fiction — science fact
John W. Campbell, Editor

July 23, 1969

Mr. Frank Meyer
1696 Ashland Avenue #9
St. Paul, Minnesota 55104

Dear Mr. Meyer:

The basic reason why the nuclear atom remains firmly in command of modern chemical and physical theories is, ultimately, that it works.

A theory good enough to permit men to compute the behavior of atoms in an atomic bomb---a radiating star---or the chemical reactions of a complex molecule---a transistor's "holes" and electrons ---is a theory good enough to be used.

No new theory is going to be accepted unless---or until---some demonstrable experiment produces a result which (1) can not be explained within the present framework, but (2) can be explained and predicted from a new theory. The experiment must be clear-cut, non-ambiguous, and important. I.e., usefully important.

Come up with a new theory of atomic structure which permits you to produce hydrogen fusion to helium, or annihilation of matter to pure energy, and the old theory will collapse.

Not without argument and reluctance, of course! The Ptolemaic theory of astronomy had been accepted because it worked—it accurately (within the limits of unaided vision, that is!) predicted the positions of the planets. Only when the telescope came into use, and permitted more exact observations of planetary positions, was the error of Ptolemaic cosmology clearly demonstrated.

But when men have a tool that works---whether it be an axe, a theory, or what, they won't give it up until they are shown a tool they can use more easily, and get better results. The axe has been given up now---for the power chain saw!

Sincerely,

John W. Campbell
Editor

JWC:jp

MASS MORE CONSTANT THAN FORCE

All too often the misleading statement is made that relativity theory has shown Newtonian mechanics to be false, particularly with respect to the absolute character of time, space and mass. Nothing could be further from the truth! No theory, before it has been proven true, can show another theory to be false. Only some devoted, unquestioning followers of Professor Einstein are satisfied that relativity theory is the truth, the whole truth and nothing but the truth. However, the author of the relativity theory in the later years of his life had good reason and the courage to question the truth of some of the postulates of his theory of relativity.

The mass-energy equivalence, discovered by Einstein, also is very widely misunderstood. It is usual to teach that this equivalence implies the conversion of mass into energy, neither quantity being conserved. In fact, $E = mc^2$ was derived from the postulates that both mass and energy are conserved.

When Newtonian mechanics or some other physical theory is in error, the physical character of the error cannot be exposed by simply presenting evidence that the theory contradicts the theory of relativity. This is the principal weakness of the argument Fred Jansen offers in Vol. IX, No. 3, RECIPROCITY, Autumn, 1979, in an attempt to refute the conceptions of mass and force, proposed by the reciprocal system of Dewey Larson. The argument presupposes that no physical idea that cannot be reconciled with a relativistic interpretation of available physical evidence can possibly pass muster.

In the light of the relativity theory, Fred insists that when a material particle, such as an electron, accelerates to zero at unit speed, c, (the speed of light), this must be because its mass is increasing to infinity (∞) rather than because the accelerating force is decreasing to zero.

$$a = \frac{F}{m} = \frac{F}{\frac{mo}{\sqrt{1-\frac{v^2}{c^2}}}} = \frac{F}{\infty} = 0, \text{ when } v = c \qquad (1)$$

Advocates of the reciprocal system of physics have no quarrel with Fred and the relativity theory advocates about their claim that mathematically they have accounted for the reduction of the acceleration, a, to zero. But what about the implicit corollary that this is the only possible correct mathematical explanation, and that it must be adopted without further ado as the true physical explanation of what is happening? Before being agreeable with this corollary, let us ask Fred and the relativists about the physical significance of the mass of an electron increasing to infinity! Does this mean anything at all if it does not mean that the mass of the electron becomes larger than the sum of the masses of all the material particles of the physical universe, including all the planets, stars and galaxies, at least of the material sector of this physical universe?

The question of infinites in modern physics has bothered physicists for 45 years, and they have not made any very substantial progress. Believers in relativity theory, quantum mechanics and nuclear physics should heed the warning of far-sighted advocates of modern physics, such as Professors P. A. C. Dirac and R. Feynman, about undue complacency in accepting theory as true which contains basic imperfections.

According to the first law of motion of Newtonian mechanics, when a body is in unaccelerated motion, the net force on it is zero. This is because in the theory of

Newton accelerated motion requires a cause, whether the cause be known or not. Newton chose to call the cause of accelerated motion "force." Thus, force is a term adopted by Newton to explain altered speed or direction of matter in motion. The fundamental terms of Newton's analysis of the motion of bodies are space, time and mass. That the motion of bodies is the subject of Newton's analysis is demonstrated by his choosing "the motion of bodies" as the title of Book I of the Principia. Fundamental to expressing the motion of bodies is the measure of this motion, called by Newton "quantity of motion" equal to the product of mass and velocity. Space, time and mass are the fundamental terms of Newton's analysis because the measure of motion of bodies, nowadays called momentum, cannot be represented except with the aid of these three terms. "Force" in Newtonian mechanics is logically defined in terms of momentum, as proportional to the time rate of change of momentum.

Applying these well-established conceptions of mass, velocity, momentum and force to the motion of bodies with speeds commensurable with unit speed, the reciprocal system explains zero acceleration at unit speed as caused by the absence of force or a net force of zero magnitude. Inertia cannot be overcome, momentum cannot be changed without force alteration. Mathematically, the reciprocal system applies the Lorentz transformation equations to the net force on the body, the net force decreasing as the $\sqrt{1 - v^2/c^2}$ when $v \to c$. Hence the acceleration, a, approaches zero as $v \to c$:

$$a = F/m = \frac{F(\sqrt{1 - v^2/c^2})}{m} = \frac{0}{m} = 0, \text{ as } v \to c \qquad (2)$$

Mathematically, equation (2) is quite as satisfactory as equation (1) in providing an account of the zero acceleration of a body at unit speed, because they obviously are mathematically equivalent.

Physically, equation (2) is preferable, because it is consistent with Newton's use of the terms mass, quantity of motion and force, and because it avoids getting involved with infinity in accounting for zero acceleration at unit speed.

Incidentally, on the first page of Fred Jansen's article he represents acceleration as decreasing by the factor $\gamma = (1 - v^2/c^2)^{-1/2}$, as $v \to c$. Does he not mean that a, acceleration, decreases by the factor $1/\gamma = (1 - v^2/c^2)^{+1/2}$ as $v \to c$? Since acceleration is proportional to force, one should expect that acceleration decrease by the same factor that the force decreases in Equation (2). Inspection of Equation (1) also discloses that $F/m_0/(1 - v^2/c^2)^{+1/2} = F(1 - v^2/c^2)^{+1/2}/m$ provided that $m = m_0$. The factor $\gamma = (1 - v^2/c^2)^{-1/2}$ does not decrease as $v \to c$, but instead increases to infinity.

The relativistic contention that decrease in force is not (but rather increase of mass is) the explanation for the decrease in acceleration at high velocities contradicts Newton's second law of motion, according to which acceleration is proportional to force, while mass is assigned the role of the constant of proportionality. This follows from the definition of force that is equivalent to the time rate of change of momentum, $\frac{dp}{dt}$, provided that mass is assumed constant.

$$F = \frac{dp}{dt} = \frac{d(mv)}{dt} = m\frac{dv}{dt} + v\frac{dm}{dt} = mA \qquad (3)$$

where $\frac{dm}{dt} = 0$ and $A = \frac{dv}{dt}$

When at low speeds ($v << c$), acceleration varies with force while mass holds constant, it is arbitrary to maintain without examination that at high speeds ($v \doteq c$) acceleration must vary with mass and must be absolutely independent of force. According

to the theory of relativity, at just what speed v does acceleration cease to vary with force and commence to vary with mass?

Kinetic energy of a body at low speeds ($v << c$) is the energy which the body possesses because of its motion, and is therefore the work which the body will do while it is being brought to rest. In the reciprocal system kinetic energy of a body at low speeds ($v << c$) and at high speeds ($v \to c$) is the energy which the body possesses because of its motion, measured by its speed displacement from unit speed, c. Unit speed, the uniform scalar rate of the space-time progression, is the transition between motion in space and motion in time. All motion in space occurs below unit speed, while all motion in time occurs above unit speed. Material particles generally move in space; cosmic particles, in time. The motion only of material bodies is here under discussion.

At low speeds ($v << c$) such a body's kinetic energy (K.E.) can be expressed as the difference between its total energy E and the energy equivalent of its mass, mc^2.

$$K.E. = \frac{1}{2} mv^2 = E - mc^2 \qquad (4)$$

At high speeds ($v \to c$) its kinetic energy (K.E.), experiment has shown, can be expressed mathematically as a more involved function of v than the second power of v, resulting from the application of the Lorentz transformation equations to the space-time progression reference frame:

$$K.E. = \frac{mc^2 \left(1 - \sqrt{1 - v^2/c^2}\right)}{\sqrt{1 - v^2/c^2}} \qquad (5)$$

It is evident that kinetic energy for high speeds in space is no longer simply proportional to v^2.

It is evident that this formula (5) holds true for electrons up to 20 billion electron volts, since, as Fred affirms, this is observed to be so.

It is also evident from equation (5) that the kinetic energy of an electron does not vary with the magnitude of unit speed, c, nor with the magnitude of its mass, m, but only with its speed, v.

The foregoing considerations make it quite evident that formula (5) is not a most potent argument for constancy of force while acceleration is altering as $(1 - v^2/c^2)^{+1/2}$ when $v \to c$.

* * * \

BIOELECTRONICS

by
Paul Little
ALBION
P.O. Box 750
Clearfield, Utah 84015

The Dewey Larson Reciprocity theory presents the concept of equation-controlled motion as responsible for physical manifestations in the universe. On one side of the equation stand the fundamental principles that physicists have discovered.

In his paper, THE INTERACTION VELOCITY OF THE ELECTRIC FORCE, Rainer Huck discusses experimental apparatus designed to determine the interaction of electric pulses. The experiment is designed to test an aspect of electric theory that has not yet been subject to proper experimental verification. If it should turn out that the pulses arrive at distinct times, there will be some substantial theoretical and practical ramifications.

It could be that NATURE has already done the experiment for us. In the early 1960s, interest in the effect of metal deficiencies in the soil on plants, and the effect of metal deficiencies in plants on animals, in the food chain to human beings, prompted an aggressive program of analysis of soils, plant roots and petioles, seeds, fruits, animal hair, saliva, urine, feces to determine the relationship of the amounts of nutritionally essential trace elements found to plant growth, crop yield, animal thriftiness and human health.

The elements of particular interest are potassium, calcium, sodium, magnesium, aluminum, manganese, zinc, iron and copper. Together with hydrogen and oxygen, they belong to an Electromotive Gradient (found in any Physical Chemistry Handbook) which dictates their order of ionization and return to metallic form. It had been theorized that potassium, operating inside the living cell, and sodium, operating outside, account for an electric charge on the membrane of around 0.2131 volts. But no one attempted to explain just how Na^+ and K^+ ions diffusing in opposite directions through the membrane accomplished this placing of a charge on the membrane.

In membrane diffusion experiments with ALBION METALOSATES (amino acid chelates of the nutritionally essential metals), we observed that diffusion into 0.7% KCl (simulating cell protoplasm) resulted in reduction of metals such as Zn, Fe, and Cu to micrometallic form on the membrane. Diffusion into 0.7% NaCl (simulating blood plasma) did not. The potassium effect reminded us of the role of potassium salts as mordants in dying fabric with colored metallic compounds.

It occurred to us that the amounts of different metals found in tissues are a record of bioelectronic activity. They must be placed there electromotively and held there by an ability of organic matter to take them out of the 'ionic' state into micrometallic form. This theory immediately appealed to us as explaining photosynthesis and the function of critical wavelengths of light in plant growth responses. The Einstein photoelectric effect has to do with the ability of critical wavelengths (or frequencies) of light to induce different kinds of metals to emit electrons. The metals must be in metallic form (or at least that was the entire experimental basis for the Einstein observation).

Getting our computer going, we remembered that the International Ampere is an amount of electricity plating 0.00118 grams of silver out of silver nitrate solution in one second. By dividing by the atomic weight of silver and multiplying by the atomic weights of our essential metals (dividing by their valence), we arrived at electrical constants that could be divided into the amounts of metals found in the tissues to give the amperes involved in placing them there.

According to the Electromotive Gradient, potassium must ionize to release the electrons required to capture and reduce the ions of metals lower than potassium in the Gradient to micrometallic form. The readily demonstrated exchange of metallic iron with copper ions serves as text book model. The Electromotive Gradient itself supplies the information needed to determine the ionization voltage for potassium with each of the different essential metals going into micrometallic form. By such calculations, we are able to convert raw data into K RESPONSE milligrams and minutes and arrive at an overall cell operating voltage based on the pattern of interaction of all of the essential metals. The potassium response (in milligrams) to each of the other metals going into micrometallic form can be added and the percent of the RESPONSE calculated for each kind of metal stimulating potassium to ionize. This greatly improved our ability to interpret the significance of the raw data. While environmental conditions, such as water, temperature, etc. affect the rate of metabolism of plants, placing the highest levels of metals found in the tissues there when plants are metabolically most active, this metabolic rate effect is completely eliminated.

We now have our computers geared to convert raw data directly into cell operating potentials and PERCENTAGE DISTRIBUTION of the electromotive activity of the different essential metals. We can tell when a maple tree is making sugar, or a corn node, by magnesium elevation; or when plants are under stress by aluminum, iron and copper elevation. The picture of the relationship of the different metals to different metabolic functions is rapidly gaining statistical momentum. Also we are learning about the effects of pollution. Air pollution with acid gases (acid rain) leaches metals from rocks and their ions contact plant roots, causing upset in the ability of plants to internally select chelation/ionization patterns.

Asking what potassium does that is so biologically important when it ionizes off the cell membranes into the protoplasm, we are reminded of the cation/anion balances electromotively required to hold molecules in solution. Organic synthesis begins, in plants, with carbon dioxide which dissolves in water to give carbonic acid. The gas releases the hydrogen atoms of water to ionize. The CO_3 ANION is ready to be used for the elaboration of organic molecules. In turn, each organic molecule, formed on the chromosome templates, by polymerization of carbon chains, needs cations to release it from the template. Potassium and sodium are the only two cations that give the necessary solubility and potassium is the one that operates inside the living cell.

So we picture potassium ionization as electromotively induced as a response to the ANION DEMAND. Newly synthesized organic molecules dictate (by their own electromotive potential) the ionization of potassium to free them from chromosome templates and the rate of K ionization. This, in turn, causes potassium to leave the membrane in Rainer Huck's 'pulses.' The quantum mechanics that has to do with the nature of the charge left on the membrane by the departing potassium ions decides which one of the other nutritionally essential metals in the Electromotive Gradient will be attracted to the membrane and caused to go into micrometallic form. Such a mechanism would explain the narrow ranges of variation in the levels of the different essential metals found in plants.

The chemistry of life requires that all interactions be reversible. We probably see alternating current threading carbon atoms together and weaving the fabric of organic tissue. Soluble organic molecules hold metal ions 'chelated' when the cell membranes release them again and hydrogen, oxygen and carbon dioxide gases take up the slack along with ammonia which caps 'finished' molecules as 'amino acids' to be assembled on chromosome templates into proteins.

Physics 399
UNIFIED PHYSICS
Sheila R. Linn
Superior, Wisconsin 54880

After taking the seminar on unified physics, I believe the most valuable lesson learned was that there is no absolutely correct theory yet discovered by humankind. Even those taught as gospel truth, such as Einstein's theory of relativity and the presently accepted structure of an atom, could be proven false. The concept of unified physics presented by Dewey B. Larson is indeed a fascinating one. All theories have their merits as well as drawbacks that need to be ironed out before they can be accepted by some people. Larson's theory of a Reciprocal System is one of these theories. He first presented his theory twenty years ago. Even though his ideas once analyzed seem sound, many have refused and even ignored his ideas. It is not going to be easy for the whole scientific community to accept Larson's ideas. I believe, however, that a person should not accept a theory blindly. She should be able to analyze the theory for herself, weigh the information, and be able to accept it or reject it. Unfortunately, many have rejected Larson's theory without even examining its virtues.

Dewey B. Larson's basic assumption is that motion is the fundamental entity of the universe. We all have been taught that matter is this entity. Even Larson's most basic assumption is revolutionary and contradicts what is accepted. When a person does decide to examine his theory, he often encounters many problems. Trying to doubt one's most basic beliefs and erasing them from the mind can be very difficult. It is necessary to have an open mind. It is obvious that if Larson's theory were accepted, all physics would change. This can take many years, since most people are reluctant to drastically change something they have lived with all their lives. Why make things difficult? It is easier to reject Larson's ideas and live with the old ideas than risk the chance of having to rewrite all scientific thought. This is not a true scientific approach, but it is possible.

The most amazing aspect of Dewey B. Larson's theory is that his whole theory depends on only two postulates, which define the characteristics of motion. He relies on no other facts or supporting assumptions in presenting this theory. This is unique. Larson's ideas are more flexible and can be applied to all scientific fields and both known and unknown phenomena. Most other theories are applied to only a particular field of study. Larson's first postulate states that the physical universe is composed entirely of one component, which is motion. Motion exists in three dimensions, in discrete units, and has two reciprocal aspects, space and time. According to the second postulate, the physical universe conforms to the relations of ordinary commutative mathematics. Magnitudes are absolute, and geometry is Euclidean. These postulates might not seem to say much at first, but they are important. Larson's whole theory surrounds his postulates. The entire matter concept of the universe is replaced by the motion concept. The universe must be thought of as consisting of units of motion instead of units of matter. Time and Space have no meaning apart from motion. Both are dependent on it. The relationship can be represented by $v=s/t$. According to this equation, time and space can be considered as two reciprocal aspects of motion. Speed (v) is the measure of motion. When space becomes greater, time becomes less and vice versa. Motion does not change because of changes in space and time. Larson chose Euclidean geometry because it is simplest. I agree with this line of thinking. All good theories should be based on simplicity. God made a world full of many different creations, but I don't think he would make anything more complicated than it needed to be.

All theories have their weak points. Dewey Larson's theory does have one weakness. I think it is the lack of mathematical formulation. As I said, Larson chose

to use Euclidean geometry and Lorentz transformation equations in supporting his ideas. He does use some formulation, but his theory could stand to have some more. Mathematics can help make unified physics more concrete. It gives the theory some-· thing to hang on to. Without it Larson's ideas are abstract and more difficult to understand. This I am sure can be worked out in time.

I admire Dewey B. Larson's courage. He knew the risks involved. His reputation was at stake when he chose to propose such a contradicting theory. Larson believed that the scientific world needed a unifying theory. He believed his ideas could be the answer; perhaps they are. Only time will tell.

* * * *

WHAT RECIPROCITY IS FOR

The purpose of RECIPROCITY is simply and clearly inscribed on its masthead--promoting the reciprocal system of physical theory.

The achievement of our purpose will require a combination of the utmost passion and the utmost intelligence with a constant readiness to investigate the reciprocal system from all its sides and in all its facets.

Only the most sustained, no-holds-barred examination of the reciprocal system, as presented in the work of D. B. Larson, R. W. Satz, A. Studtmann, etc. can enable each NSA student to learn for herself or for himself whether or not the reciprocal system is the true unified physics natural philosophers have been searching for during many centuries.

RECIPROCITY welcomes contributions of those who think for themselves about the reciprocal system, whether questioning a claim of this theory or answering a question in agreement with the theory or in disagreement.

Unlimited space is not given to expression of disagreements with the reciprocal system, because space in RECIPROCITY is limited and some of this space is reserved for NSA supporters to respond to assertions that the reciprocal system is wrong and/or some rival theory is right on some moot point.

In critically examining the reciprocal system it is not intended to spare the prevailing theories of nuclear physics, quantum mechanics, relativity theory, etc. from questioning and criticism. Exposure of their inadequacies and errors, when found, provokes more readiness to give the new reciprocal system a fair trial.

Modern physics research does not merely consist of reexamining the prevailing theories of nuclear physics, quantum mechanics, relativity theory, elementary particle physics, etc. and the challenging reciprocal system. New theories, usually based on but departing from the prevailing theory and independent of the reciprocal system, have been invented and currently composed.

This issue of RECIPROCITY prints MATTER AND GRAVITATION by Dr. Roman Skorski of the University of Alabama. Professor Skorski was unacquainted with the reciprocal system and its DIFFERENT theory of gravitation and matter when he produced this report of his theory. One of the reasons for printing the Skorski paper is to provide readers of RECIPROCITY with an interesting example of theory INVENTION, the dominant way of doing science in modern times to contrast with the theory INDUCTION technique, preferred by D. B. Larson in creating the reciprocal system.

Although Professor Skorski's theoretical invention is no more remote from explaining gravitation than Professor Einstein's invented theory of gravitation, several respectable journals of physics have refused to publish it on the grounds that it is unorthodox, it is not mathematical enough and the relativistic theory of gravitation seems to be adequate. In fact, Einstein's general relativity explanation of gravitation has no more been confirmed than Skorski's. In fact, all invented theories of gravitation, published since Newton's inductive theory, have in common a basic assumption which Newton refrained from publicly endorsing while privately believing it: that gravitation necessarily involves SOME kind of INTERACTION among material particles. The assumption is NOT necessarily so.

The reciprocal system of D. B. Larson implies rejection of ALL conceptual interpretations of the Law of Gravitation which regard gravitational motion as caused by

some physical INTERACTION between physical systems, whether caused through curvature of the space-time continuum or by action at a distance. Instead the Law of Gravitation is regarded as the expression of an intrinsic physical motion of all material systems toward ALL space-time locations, whether or not such space-time locations are occupied by matter. The space-time locations in Larson's theory are not ultimately continuous and not stationary, but rather discrete aspects of an outward self-moving space-time progression at the uniform scalar rate of 3×10^5 kilometers/second. The expansion of the material sector of galaxies in all directions is attributed to this specified scalar increase of space with increasing three-dimensional time (cf F. H. Meyer, J. Minnesota Acad. of Sci. 41, 44, 1975).

Unlike the gravitation theory of D. B. Larson, Professor Skorski's report about gravitational motion fails to recognize that like electric and magnetic force, gravitational force has a REPULSIVE as well as an ATTRACTIVE side and that gravitational force is the REPULSIVE force of solid cohesion, the space-time progression force constituting the ATTRACTIVE force holding atoms together in the solid phase.

In another important respect, however, Professor Skorski's report dissents from a shibboleth of modern physicists: that there must be matter before there can be light; light, like motion, is a mere derivative of matter. The report shares what Dr. Skorski calls "an ultimate conclusion" with both the Bible and the reciprocal system of physics: matter is a derivative of light, formed by rotating photons.

* *

SPECULATIONS IN SCIENCE AND TECHNOLOGY

David Halprin, NSA Australian correspondent, has informed our movement about a lively scientific journal, SPECULATIONS IN SCIENCE AND TECHNOLOGY, originating in Australia. This publication is "An international journal devoted to speculative papers in the physical, mathematical, biological, medical and engineering sciences."

We who plan to promote the reciprocal system of theory appreciate the value of a journal that does not discourage publication of research reports critical of nuclear physics, quantum mechanics, elementary particle theory, relativity theory and/or solid cohesion theory, but rather actually welcomes dissenting views expressing critical weighing of the relevant evidence.

Think of SPECULATIONS IN SCIENCE AND TECHNOLOGY as an ally of RECIPROCITY rather than an unfriendly rival. The time has come to secure for the reciprocal system the widest public attention and exposure possible. RECIPROCITY is our main news organ for accomplishing this purpose, but we should seek every possible opportunity and welcome every available arena to present our ideas for the revaluation and unification of physics and natural philosophy.

For you who may wish to submit manuscripts advocating the reciprocal system in SPECULATIONS IN SCIENCE AND TECHNOLOGY, here is the name and address of the Editor, to whom they should be sent:

Editor, William M. Honig
Western Australian Institute of Technology
Perth, S. Bentley, 6102, Western Australia

MATTER AND GRAVITATION

by
Dr. Roman Skorski
University of Alabama College of Engineering
University, Alabama 35486

Summary

A subparticle, named spino, has been deduced to exist from an electron wave theory related to the electron rest state. The author formulates the hypothesis that space is occupied by a superfluidic crystal of spino ether which has superheat conductivity and superheat capacity. Spino is a massive lepton having a mass of about 7.369×10^{-48} g and a radius of 2.28×10^{-33} cm. Spino ether could not be detected by Michelson-Morley's experiment because all matter, regardless of its degree of opacity, is transparent to it. This ether prevades the universe with no resistance to any matter including atoms, electrons and hadrons. Further, fermions are considered to be vortices of the superfluidic spino ether.

A δ (delta) function containing the ether in coordinates of time (t) and distance (L) has been computed from the electron spin $S = \pm \frac{1}{2}\hbar = 0.527 \times 10^{-27}$ erg. sec. and force $F = \frac{e^2}{d^2} = 3.94 \times 10^{-15} \frac{erg}{cm}$. This δ function has been designated a constant $P = \frac{S}{F} = t \times L = 1.337 \times 10^{-12}$ cm sec. By this function t_{max} and L_{max} of the spino ether have been estimated to be: $t_{max} = 5.83 \times 10^{30}$ sec., $L_{max} = 1.564 \times 10^{41}$ cm. The function has also affected the formation of a very simple equation interrelating the universal constants $c = P.G.\ \rho_{et}$* where G is the gravitational constant and c is the speed of light. From this equation, the density ρ_{et} of spino ether and the distance d_{sp} between spinos in the ether have been computed as $\rho_{et} = 5.275 \times 10^{31} \frac{g}{cm^3}$ and $d_{sp} = 2.75 \times 10^{-27}$ cm. Matter is considered to be a rarefaction of spino ether because hadron vortices have holes inside. Analogously, black holes are giant spino ether vortices having no spino ether inside and in which the temperature is 0°K.

In concise terms, this theory means that gravitation is not an effect due to the illusive concentration of mass but is an effect due to rarefaction of the supermassive and superfluidic crystal of spino ether. This is analogous to Copernicus transposing the geocentric system into a more functional heliocentric system.

Spino Ether

This research is essentially a continuation of the previously published paper, Spino Ether and its Vortices: Leptons and Hadrons (1). Therefore, before proceeding further, it seems appropriate to give an accounting of that paper.

The initial basis of spino ether theory has been the puzzling number ~ 137 which appears in the fine structure constant α as its inverse $1/\alpha = 137.03 \pm 0.016$. Dirac has related it to the electron structure in the following way:

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*As published by the author in the Bulletin of APS Vol. 22, No. 10, Nov. 1977, p. 1257 and in his book "The Elements," Dongmyeongsa, Seoul, Korea, 1977, p. vi.

[1]Underlined numbers in parentheses refer to items in the list of references at the end of this report.

$$\frac{h.c.}{2\,\P\,e^2} \approx 137 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

In writing this relationship, Dirac states: "e will have to be explained in some way in terms of the square root, though square roots do not occur in the basic equations" (2). However, since e^2/d^2 represents force, e^2/d_e^2 is the fundamental physical value of an electron, or positron (3).

Let us write an equation for the mechanical energy of an electron in its rest state.

$$m_0c^2 = h\,\nu_e \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Hence, it is equal to the energy of a photon characterized by a gamma ray frequency ν_e.

Since the velocity of propagating gamma photons can always be expressed in terms of the corresponding wave length λ_e and frequency ν_e, we can write the equation of the motionless electron in the following form:

$$h\,\nu_e = m_0.c.\,\lambda_e.\,\nu_e \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

and dividing both sides by: ν_e

$$\lambda_e = \frac{h}{m_0.c} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

$$\lambda_e = 2.4248 \times 10^{-10}\ \text{cm} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Let it now be proposed that λ_e is the length of the path of a helix in which the height and the diameter are the diameter d_e of the classical electron: (1).

$d_e = 2a \approx 5.64 \times 10^{-13}$ cm, then the number of turns (Nt)

of the helix is: $Nt\,\frac{\lambda_e}{d_e\,\P} \sim 137 \quad \ldots\ldots\ldots\ldots\ldots (6)$

Note that the dimensionless numbers, resulting from both equations 1 and 6 have approximate values of the inverse constant α, of the electron fine structure $1/\alpha = 137 \pm 0.016$. It is also interesting to note that this number can be approximately factored into the very basic geometrical number $\P = 3.141\ldots$, the spacial wave function $e = 2.782\ldots$ and the very symmetrical number 2×2^3 or $\P \times e \times 16 = 136.6$. Indeed, the geometry of an electron appears to be a significant phenomenon. It conjectured that the small differences between all of the above numbers, which approximate 137, may result from a lack of exactness in evaluation of the constants appearing in equation 1 and 6 and the α constant. Alternatively, it may indicate some factor related to the curvature of the spino ether vortex forming our universe. At this point reference is made to a conclusion that dimensionless numbers are, in reality, planes in the distance-time coordinants of the spino ether system (1).

At any rate, Dirac's enigmatic ≈ 137 is in reality the Nt and it has provided a basis for the electron spino ether vortex theory. According to this theory, the difference between spino ether electron vortices and hadron vortices is such that, in the former, spinos are magnetically polarized while in the latter, instead of the magnetic core, a micro black hole is inside (1).

At this time one should recognize that Planck's constant h is hidden in the very elementary photon of 6.622×10^{-27} erg and that photons of different frequencies are in multiples of this elementary photon which has been identified with the spino energy.

$$E = n\,[h]\ \text{erg} \quad \ldots\ldots\ldots\

Note that the constant P appears to be a δ function in the coordinates of time t and distance L. This product of distance and time, or the P constant, together with the constant c which is the maximum ratio in spino ether of distance L over time t (the speed of light)

$$c = L/t = 3 \times 10^{10} \text{ cm/sec} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (16)$$

discloses that the interrelated gauges of distance and time are:

$$\text{Distance unit} = \frac{P}{t} = 2.95 \times 10^{20} \text{ cm} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (17)$$

$$\text{Time unit} = \frac{P}{L} = 4.57 \times 10^{-33} \text{ sec} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (18)$$

These gauges appear to be natural units of distance and time, while P represents the unit area in the distance - time Cartesian coordinants.

It is apparent that the constants P and c show that neither distance nor time can be confusingly and unrealistically infinite. This desirable restriction is imposed by the spino ether because a spino must be confined to the P function and its dimension and time period may be determined. In the P function, when L is taken as a single quantum of distance or the radius of a spino given by equation 12, $a_s = 2.28 \times 10^{-33}$ cm, the time period of spino t_{sp} is:

$$t_{sp} = \frac{P}{a_s} = \frac{\pm\ 1.337 \times 10^{-12} \text{ cm sec}}{2.28 \times 10^{-33} \text{ cm}} = 5.83 \times 10^{30} \text{ sec} \quad . \quad . \quad (20)$$

$$t_{sp} = \frac{\pm\ 5.83 \times 10^{30} \text{ sec}}{3.15569 \times 10^{7} \text{ sec/year}} = \pm\ 1.87 \times 10^{23} \text{ years}$$

In order to determine the maximum dimension of the spino ether, we use the maximum admissible ratio of distance over time in the spino ether, which is the velocity of light, multiplied by the duration of the spino ether t_{sp}:

$$L_{max} = \pm\ 5.83 \times 10^{30} \text{ sec.} \times 3 \times 10^{10} \text{ cm/sec} \quad . \quad . \quad . \quad . \quad . \quad . \quad (21)$$

$$L_{max} = \pm\ 1.76 \times 10^{36} \text{ km}$$

Hence the single time quantum can be defined:

$$tq = \frac{P}{L_{max}} = 7.62 \times 10^{-44} \text{ sec} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (22)$$

The interpretation of the $\pm$ signs has been presented as follows: When the ether has reached this immense L_{max} radius, it will contract with a reversal of time until the primordial radius of one quantum of distance is attained. Hence the world of the spino ether has zero values for all conserved quantities and it could have appeared from nowhere without violating any conservation laws. Such a possibility is consistent with the properties which have heretofore been established for our own universe (5, 6). For example, quantum electrodynamics reveals that an electron, positron and photon occasionally emerge spontaneously from an absolute vacuum. When this happens, the three particles exist for a brief time, and then annihilate each other. The

spontaneous temporary emergence of particles from a vacuum is called vacuum fluctuation and is common in quantum field theory. Since the laws of nature place no limit on the scale of vacuum, it is applicable to the entire spino ether. The duration of its fluctuation is, of course, subject to the restriction:

$$\Delta E \, \Delta t = h \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (23)$$

The Δt of the spino ether is the $2|t_{sp}|$, whereas the $(+t_{sp})$ is the positive half of this period which is followed by the second half of the period or the period of the time reversal $(-t_{sp})$. Hence the completion of the total period $2|t_{sp}|$ brings about the net zero energy E in the spino ether events.

The Fundamental Equation of Space

The convenience of the constant P can be seen in the following equations:

$$c = P \times G \times \rho_{et} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (24)$$

In this equation:

c is the maximum ratio of distance over time = 3×10^{10} cm sec^{-1}

G is the gravitational constant = 6.67×10^{-11} cm^3 sec^{-2} g^{-1}

ρ_{et} is the spino ether density which has been computed to be:

$$\rho_{et} = 3.33 \times 10^{32} \text{ g/cm} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (25)$$

It is clear that the equation interrelates all of the most fundamental constants: c, G, ρ_{et}, and also the spin $S = \pm 1/2 \times \hbar$ and the ratio $F = (\text{charge})^2/(\text{diameter})^2$.

It is important to note that e^2/d_e^2 has the dimension of force and thus electrons and spinos always carry negative and positive charges. Further, it is not the electric charges e or e_s, as such, but the moment of their dipoles that is the fundamental physical constant F: $F = 3.94 \times 10^{-16}$ erg/cm.

By knowing the spino mass, $m_s = 7.369 \times 10^{-48}$ g (10), one may estimate the inter-spino distance from the spino ether density ρ_{et}:

Hence, $$d_{et} = 2.72 \times 10^{-27} \text{ cm} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (26)$$

Aristotle's Spheres Now Vortices

In addition to the above mathematical formulations of spino ether, it has been conjectured that spino ether has superheat-conductivity and superheat-capacity. Superheat-conductivity of spino ether has an analogy with superheat-conductivity of helium II at 2°K. At this temperature, helium is in an unusual state of superfluidity and superheat-conductivity since its heat conductivity has the velocity of light. The propagation of heat as infra-red electromagnetic waves through the superfluidic crystal of spino ether has the same velocity.

The superheat capacity of spino ether may be deduced by the following reasoning. Hadrons are the hollow vortices of the superfluidic spino ether and therefore they have small heat capacities. This could be judged by considering that the heat capacity of one gram of each element is inversely proportional to its atomic mass or to the ratio of hadrons per atom. In other words, a gram of atoms of higher mass consists of a

greater rarefaction of spino ether and therefore has less heat capacity than a gram of an element with a lower atomic mass. Areas devoid of spino ether, such as black holes, have no heat capacity and no heat conductivity. Because of this property the black holes must be very hot at the surface since they can not absorb heat devrived from the exothermic reaction with the surrounding spino ether.

The superheat capacity of spino ether appears to explain the mystery of the "Entropy of the Universe" where all energies are "dumped" with little effect because the temperature remains at a very low level of about 3°K. However, this temperature determination is subject to refinement and therefore may actually be closer to 2°K. Since liquid helium, within range of 1-2.4°K, is a superheat conductor the same as spino ether, there is an easy heat flow between them in the same sense as there is easy flow of electricity between two conductors. Therefore, when liquid helium is cooled down, the very great heat loss to spino ether at 2°K takes place. This fact is illustrated by the specific heat versus temperature diagram in figure 1.

At its surface (the interface with the surrounding absolute emptiness) the world of spino ether is under surface tension. However, on the spino ether surface, cosmic vortices and rotons are formed in the manner that vortices and rotons have been observed at the surface of a superfluidic crystal of liquid helium II (6). Such vortices of spino ether draw the emptiness into the superfluidic spino crystal which results in the formation of vortices of universes, galaxies, stars, plantets . . . all of which have inside, or in their center, absolute emptiness or black holes. In other words, once the the vortex of a universe has been formed, smaller vortices of galaxies are formed on its internal surface. On the internal surface of the galaxies, still smaller vortices of stars and planets are formed. Thus Aristotle's concept of the dominant role or spheres in shaping matter has been revitalized by replacing spheres with vortices. In fact it can be stated that stars and planets have originated from spherical black holes on the surface of which fermion vortices are formed. This reaction results in the consumption of the black hole and in heat evolution which results in a coating of the fermions covering the holes. The fermions in such coatings undergo gradual organization so that they form different elements, beginning with those of the strongest bonded nuclei: He, Ca, Fe, Ni . . . . The thicker a coating is, the lower is its temperature, but it is subject to eruptions and/or explosions, such as are observed on the sun and other stars. Dead planets and stars are those in which black hole cores have been totally exhausted. They have no volcanos or other similar phenomena. The climate of planets is dependent on the remnant black hole in the center and on its exothermic reaction with the spino ether which is ubiquitous with the exception of black holes, of course.

Gravitation

It should be recognized that there is no answer to the question, "Why is there gravitation?", although, there are tendencies to consider a gravitational field to be analogous to electric and magnetic fields. This approach results from the fact that the attraction between massive bodies is analogous to the attraction between two charges of opposite sign. However, the latter condition does not exist in the attraction mechanism between masses since there are no masses of opposite sign.

The attraction between masses appears to be analogous to the attraction between voids and/or sites with missing atoms in solid and in liquid crystals. The attraction may also be analogous to that between foreign particles dispersed in a metal matrix. For example, Be-10% Cr is an alloy which forms a solid solution at 700°C and, when quenched from about 700°C in water at room temperature, retains chromium particles totally dispersed in the matrix of beryllium. When the alloy is reheated to about 700°C and then slowly cooled, the chromium particles flock into large chromium crystals which are embedded in the beryllium matrix. This process results in the growth of

large crystals at the expense of small ones which is a consequence of the decrease of surface energy, and hence free energy, of the total volume of chromium crystals as required by the Second Law of Thermodynamics. This motive force also draws together dispersed voids in solid and liquid crystals. The laws of thermodynamics must be applicable to the superfluidic spino ether crystal. The motive force of gravitational attractions between illusive massive bodies, which are voids and rarefactions in the spino ether, are of the same nature. The great attractive force between hadrons in atom nuclei relies on the fact that hadrons have micro black holes inside. This attractive force is so great that the repulsive force of protons in nuclei is of little effect and thus the imaginary gluons are not needed.

Ultimate Conclusion

This paper has dealt with a set of numbers which are the constants of basic forces of nature such as Planck's constant, the fine-structure constant, Newton's gravitational constant and the electron dipole force constant. These constants are herein used to formulate the fundamental equation of the cosmos:

$$c = P \times G \times \rho_{et}$$

The results of this paper appear to confirm the intuition: "Light came first, all else followed. Gradually light begat matter." Clearly, this is applicable to the superfluidic spino ether crystal because spino is the elementary particle of light and because matter consists of spino ether vortices.

Discussion

This theory of matter and gravitation has been deduced by a very elementary algebra and will need additional theoretical work. For the present time there are several points to be discussed.

1) The spino particle has been derived from Planck's constant h since in essence it constitutes the elementary photon of 6.622×10^{-27} erg (1, 3). It has been conjectured that the electromagnetic field of an electron at rest results from a flow with the velocity of light of 1.2364×20^{20} spinos in a stream of 137 parallel spirals, forming a spino ether vortex with the very large magnetic moment characteristic of electrons. The mass and charge of the spino have been defined as single quanta m_s and e_s. Until now it has been unclear whether spinos are bosons or whether they are fermions. The work of Wess and Zumino, and others allows the conclusion that spinos constitute a quantum system wherein the conversion of bosons into fermions and fermions into bosons takes place (7). A supersymmetry transformation such as this is remarkable in that it affects the coordinants of space-time (7). Hence, the transformation is valid for the spino ether system because its δ function or the P constant is in these coordinants.

2) The constants P and c have allowed the determination of not only the minima of distance and time or their single quanta in the spino ether, but also their maxima. These quantum mechanical values restrict the dimensions of spino ether. Obviously since the maximum radius of spino ether has been deduced from the P and c constants, these constants may be dependent on the maximum radius of the spino ether which in turn may be a function of the density and viscosity of the superfluidic ether in the state of the minimum free energy of its surface tension.

3) The importance of the P constant is also derived from the fact that it has permitted the formulation of the very simple equation interrelating the most important universal constants: $c = P \times G \times \delta$. This equation allows the determination of the density of the supermassive spino ether where the elusive masses are voids or other rarefactions of the ether.

4) It has been indicated that the supermassive spino ether has superheat capacity, that it is superfluidic, and that it is a superheat conductor. Relative to these properties, spino ether has a corollary in liquid helium at 2°K. This metaphorism has been extended to account for the possible formation of the quantum mechanical vortices of different scales in the superfluidic spino ether. This phenomenon is analogous to the vortices which have been observed in the superfluidic helium and which are a quantum mechanical phenomenon.

5) Since vortices of the spino ether make matter, the matter is absolutely transparent to the spino ether and no wind in the spino ether could be made by motion of the matter and thus the Michelson-Morley's experiment was irrelevant to the spino ether.

6) When a supernumerary spino, or a bundle of spinos like a photon, is injected into the spino ether superfluidic crystal, it has no place to be accommodated in the crystal lattice. Therefore it can exist only at the speed of light until it finds a gap in the ether in which to fit; otherwise, it may be changed into another form of energy. However, in its path, a photon gradually loses some of its spinos to voids in the superfluidic spino ether crystal. Thus the high energy photons gradually undergo degradation as manifested by the "redshift."

7) It is in order to discuss the unitary fields in the superfluidic spino ether crystals. It is thought that gravitation in spino ether is a thermodynamic effect and it seems that the unitary fields may ultimately depend on thermodynamic laws so that all reactions establishing equilibrium in natural systems result in their minimum free energy.

From the above point of view, gravitation has been presented in terms of a surface tension of the superfluidic spino ether crystal in the vicinity of voids and other rarefactions of the ether. Further, it is well known that when an electric charge is placed in a dialectric, such as water, its surface tension is reduced and therefore water can flow through finer capillaries (8, 9). Similarily, when ferromagnetics are annealed in a magnetic field, their grain structures undergo a considerable refinement (10, 11). Thus, these charges should have an effect on the surface tension of the spino ether. In this discussion one should visualize that a spino is an electric and magnetic dipole that is polarizable by both electric and magnetic fields to the degree of the field intensities (1). When two charges have opposite signs, the field between them is superimposed and this results in the double attractive force between the charges. Conversely, when the signs of the two charges are the same, repulsion between them exists due to the inconsistent polarization of the spinos between the charges. This effect alone is strong proof of the existence of spino ether. This is the obstacle with which researchers in unitary field theory must cope because unlike charge, mass has no sign unless voids in spino ether are considered to be negative mass. Thus single sites of missing single spinos in the superfluidic crystal of spino ether may be appropriately named gravitons. This statement can be made with the understanding that gravity is only associated with voids (holes) and thereby is associated with matter which is a rarefaction of the spino ether because matter consists of hadrons which have micro black holes inside.

8) Finally a position is taken relative to the "big bang" theory of the origin of the Universe. Support for it has been mentioned with the prediction of the annihilation of the universe by shrinking from its maximum size to the size of a single spino. Its expanding and contracting periods have been defined with an interpretation of the double sign of spins ± P constant. However, when one considers that these signs come from the double sign of spin ± S which in fact is a notation of the left and the right handed fermions, then these signs mean that the spino ether may be composed of either left-handed or right-handed spinos or of a mixture of both. Judging by the weak interactions observed in our own spino ether world, one may conclude that it is composed of predominantly left-handed fermions. In other words, it is in an unbalanced state and may readily combine with another world of spino ether with predominately right-handed fermions. This reasoning may be extended to the possible existence of a resonance between our own spino ether world and another one that is a mirror image of ours, and that both worlds periodically change their constituents from left to right-handed and vice-versa. At this point it should be recognized that electromagnetic occurrances involving spin +1/2 $\bar{h}$ display reversal of time versus those involving spin -1/2 $\bar{h}$. Therefore the resonance between such two worlds would display a periodic reversal of time (12) which of necessity would be accompanied by the inversion of thermodynamic laws or by reversal of absolute (13) temperatures in these two spin systems. Hence the total energy of the resonating worlds always equals zero.

Such exchange resonance of left-handed and right-handed spino ether between two worlds is comparable to the liquid helium pendulum between two connected vessels at 2°K. When liquid helium is totally removed from one vessel to the other then the reverse flow takes place. It is surprising that this flow does not stop when the superfluidic helium in both vessels is of the same level. Similarly, in the proposed model of the two resonating worlds, the antiparallel flows of left-handed and right-handed spinos does not stop when the level of both is the same in the two spino ether worlds. At the end of each cycle the spino ether in the two opposite worlds consist of 100 percent spinos of opposite sign. Then the reverse antiparallel flow of the opposite sign spinos in this perpetual pendulum of the superfluidic spino ether takes place.

In this discussion of the creation of matter, including the above hypothesis of the two perpetually resonating worlds, it is apparent that eternal life for mankind is possible.

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Minutes of the Business Meeting of the Fourth Annual Convention of the New Science Advocates

Friday, July 20 and Saturday, July 21, 1979, at the University of Wisconsin at Superior

The business meeting of the New Science Advocates was called to order at 9:20 a.m. by Frank Anderson, president. Fifteen members were present.

1. The minutes of the Third Annual Convention of the New Science Advocates, held at the University of Utah, were read and approved. The secretary also mentioned that a notebook had been established for all important documents, such as bylaws, minutes, list of board members, registration form for local chapters, address list, and issues of Reciprocity.

2. The treasurer's report was then presented by Rainer Huck. NSA has a net worth of $177.24 plus the assets in 1000 copies of the paperback edition of New Light on Space and Time. The treasurer's report was accepted. (The motion by member Phil Porter to applaud the individuals who lent NSA $850 was, of course, carried.)

3. Next Frank Meyer presented the editor's report.
a. An audit card was sent out to 500 readers of Reciprocity; the result: 127 cards were returned.
b. 1400 copies of the first issue of 1979 and 1000 of the second issue were sent out.
c. The cost for 500 copies is $100 and the cost for a 1000 copies is $200.
d. There are now 150 paying subscribers.
e. Frank took into consideration the recommendations by members David Halprin and Florence Castner:
   1) set up a new filing system
   2) do own collating
   3) check different postal rates
   4) have separate first class mailing rates for those who want it
   5) obtain the rosters of various organization such as the Minnesota Association of Physics Teachers, the Wisconsin Association of Physics Teachers, the Philosophy of Science Association, the American Physical Society, etc.

4. The president then asked if there were any Old Business.
a. Member Frank Meyer explained the choice of time and place for the meeting. The Board of Trustees had voted to come to the University of Wisconsin and Dean Feldman had agreed to an honorarium for Mr. Larson. Also, as Mr. Larson pointed out, this was to be a final "blowout" for Frank, who is a professor here (and about to retire).
b. Mr. Larson stated that North Pacific Publishers has its own organizational brochure, which can be made available for use in correspondence.
c. Member Steve Berline moved that Reciprocity be independently audited if the cost is less than or equal to $25. The motion carried.
d. Member Arnold Studtmann suggested the use of gift subscriptions sponsored by NSA members. But after discussion, no motion was made.

5. The president then asked for New Business.
a. Member Frank Meyer stated that he had available Mr. Larson's talk (the night before) on cassette tapes. Nearly all members present purchased a cassette.
b. Member Florence Castner moved that NSA set up a committee to examine and improve the operation of NSA. The initial report of the committee was to be made the following day. After considerable discussion, the motion was seconded and carried. The members of the committee were chosen to be Castner, Satz, Huck, and Studtmann.

c. Mr. Larson stated that 2500 copies of his new book Nothing But Motion had been printed. The 430 orders by members in NSA were to be sent out August 3rd.
d. Member Rainer Huck moved that the price of mailed out copies of New Light on Space and Time be raised to $4.50. Member Florence Castner moved to amend the motion to raise the price to $5.00. The amendment was seconded and carried, and then the motion carried. Of course, all old orders were to be honored at the previous price.
e. Member Phil Porter moved that a directory of members be published. But the motion was tabled to the next day's meeting.

6. The meeting was adjourned at 11:36.

The business meeting of the New Science Advocates resumed at 1:45 p.m., Saturday.

7. The annual elections were held. Members Frank Anderson, Ronald Satz, and Rainer Huck were re-elected. Members Todd Kelso and Arnold Studtmann were nominated for vice-president and Studtmann was elected.

8. Next it was necessary to bring the board membership into compliance with the By-Laws. Based on motions by members Todd Kelso and Florence Castner, 5 individuals were elected for 1 year terms, 5 for 2 year terms, and 5 for 3 year terms. Members Anderson, Huck, Satz, and Studtmann were elected to three year terms; members Brown, Mitchell, Long, Windolph, and Wuenscher were elected to two year terms; and Kelso, Norris, de Lespinasse, Blackburn, and Berline to one year terms.

9. Recommendations were taken for the location of next year's meeting. Hawaii was voted down, but Los Angeles was accepted.

10. Member Florence Castner moved that the form and procedure developed by the secretary for local chapter registration be accepted but that the Board members ratify it (not just the secretary). The motion was seconded and carried.

11. Finally, the organization committee reported its set of recommendations to the Board.
a. There should be different categories of membership, based on monetary contribution.
b. A general organization brochure should be designed and printed. This would include a short description of the Reciprocal System, the organization goals, list of publications, list of prominent members, a logo, etc.
c. A speakers bureau should be set up. A directory of members and associates should be set up by area. Only those individuals who sanctioned it would be listed.
d. Private and possibly NSF grants would be sought.
e. Use of various media is recommended for publicizing the Reciprocal System and the New Science Advocates.

The Board is to take all of these recommendations under advisement.

12. The meeting was adjourned at 3:48 p.m.

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Editor: F. H. Meyer
102 Ross Hall
University of Wisconsin-Superior
Superior, Wisconsin 54880

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